US005479678A

United States Patent [19]

Reed et al.

[11] **Patent Number: 5,479,678**

[45] **Date of Patent: Jan. 2, 1996**

[54] **LOCKING HINGE**

[75] Inventors: **David G. Reed**, Langhorne; **Philip Olikara**, Newtown, both of Pa.

[73] Assignee: **Martin Marietta Corp.**

[21] Appl. No.: **393,585**

[22] Filed: **Feb. 21, 1995**

[51] **Int. Cl.**[6] **E05F 1/08**

[52] **U.S. Cl.** **16/325**; 16/303; 16/361

[58] **Field of Search** 16/325, 280, 284, 16/283, 285, 303, 348, 350, 361, 362

[56] **References Cited**

U.S. PATENT DOCUMENTS

2,285,510	6/1942	Gronberg et al.	16/361
4,389,748	6/1983	Grossman	16/303
4,960,256	10/1990	Chihara et al.	16/361
5,393,018	2/1995	Roth et al.	16/325
5,398,378	3/1995	Lin	16/303

Primary Examiner—P. Austin Bradley
Assistant Examiner—Adesh Bhargava
Attorney, Agent, or Firm—W. H. Meise; C. A. Berard; S. A. Young

[57] **ABSTRACT**

A hinge includes a first clevis (**30**), defining a vee-block support (**12**) and a first limiter surface (**44, 46, 48**). A cylindrical hinge shaft is supported by the vee-block (**12**). A second clevis (**140**) is affixed to the shaft, whereby the second clevis may rotate in response to torques. The second clevis has a limiter surface (**148**) which coacts with the first limiter to limit rotation of the shaft and second clevis past the deployed state. The second clevis (**140**) has a cam follower (**158**) at a predetermined distance from the axis of rotation (**2**). A cam (**100, 104**) affixed to the first clevis (**30**) rotates about a cam axis (**3'**). The deployed-state engagement between the cam and the follower snugs one end of the shaft into the vee-block, while the rotation limiters snug the other end. A rotational driver (**50, 54, 70, 75, 90, 110**) urges the cam (**100, 104**) to rotate in a direction which tends to move the second clevis (**140**) from the stowed state toward the deployed state. The use of vee-blocks reduces manufacturing tolerances, and the hinge is loose, and rotates easily, from a first (stowed) state until it reaches the second (deployed) state. In the deployed state, the camming action, in conjunction with the stops, tightens the hinge pin into the vee-blocks, making a rigid structure.

4 Claims, 5 Drawing Sheets